Clinical Trial Protocol
Iranian Registry of Clinical Trials

16 Sep 2026

Comparison of the effect of eight weeks of plyometric exercises with and without electrical muscle stimulation (EMS) on motor function, postural control and strength in athletes with ankle instability

Protocol summary

Study aim

Comparison of plyometric training with and without EMS on motor performance, postural control and strength of athletes with ankle instability

Design

36 female athletes with functional ankle instability divided into two experimental and one control groups. The simple randomization method was used to assign individuals to groups that in this method, random allocation software was used to create a random sequence.

Settings and conduct

The present study is a quasi-experimental research with a pre-test - post-test design. 36 Female Athletes with Ankle Instability randomly divided into two experimental and one control groups. Motor performance, postural control and strength are measured before and after exercises.

Participants/Inclusion and exclusion criteria

Athletes with ankle instability; age range 18 to 26 years old; at least once ankle sprain in the last 6 months; pain intensity calculated from the Pain Scale Test (VAS) at least 4.

Intervention groups

The first intervention group included female athletes with ankle instability who received a plyometric exercise intervention. The second intervention group included female athletes with ankle instability who received the intervention of plyometric exercises with electrical muscle stimulation (EMS). The control group included female athletes with ankle instability who did not receive any intervention.

Main outcome variables

Motor performance; Postural control; Strength

General information

Reason for update

Acronym

IRCT registration information

IRCT registration number: **IRCT20200107046035N7**
Registration date: **2022-01-05, 1400/10/15**
Registration timing: **prospective**

Last update: **2022-01-05, 1400/10/15**
Update count: **0**

Registration date

2022-01-05, 1400/10/15

Registrant information

Name
Hossein Shahrokhi
Name of organization / entity
Hakim Sabzevari University
Country
Iran (Islamic Republic of)
Phone
+98 51 4401 2756
Email address
h.shahrokhi@hsu.ac.ir

Recruitment status

Recruitment complete

Funding source

Expected recruitment start date

2022-01-21, 1400/11/01

Expected recruitment end date

2022-03-20, 1400/12/29

Actual recruitment start date

empty

Actual recruitment end date

empty

Trial completion date

empty

Scientific title
Comparison of the effect of eight weeks of plyometric exercises with and without electrical muscle stimulation (EMS) on motor function, postural control and strength in athletes with ankle instability

Public title
The effect of plyometric exercises with and without electrical muscle stimulation (EMS) on motor function, postural control and strength in athletes with ankle instability

Purpose
Treatment

Inclusion/Exclusion criteria

Inclusion criteria:
Ankle Instability Age range 18 to 26 years Ankle sprains at least once in the last 6 months Pain intensity calculated from the Visual Analog Scale (VAS) at least 4 Athlete

Exclusion criteria:
Perform exercises outside the researcher's supervision Absence of three general sessions and two consecutive sessions of exercises Referral pain to the lower limb during activity

Age
From **18 years** old to **26 years** old

Gender
Female

Phase
N/A

Groups that have been masked
No information

Sample size
Target sample size: **36**

Randomization (investigator's opinion)
Randomized

Randomization description
The simple Randomization Method was used to assign individuals to three groups that in this method, Random Allocation Software was used to create a random sequence. Then, in order not to determine which group the individuals will be assigned to before dividing them into two groups, or in other words, allocation concealment, the central randomization method was used.

Blinding (investigator's opinion)
Not blinded

Blinding description

Placebo
Not used

Assignment
Parallel

Other design features

Secondary Ids

empty

Ethics committees

1

Ethics committee

Name of ethics committee
Sport sciences research institute

Street address
No. 3, 5th Alley, Miremad Street, Motahhari Street, Tehran, Iran.

City
Tehran

Province
Tehran

Postal code
1587958711

Approval date
2021-07-20, 1400/04/29

Ethics committee reference number
IR.SSRC.REC.1400.072

Health conditions studied

1

Description of health condition studied
Ankle Instability

ICD-10 code
M25.3

ICD-10 code description
Other instability of joint

Primary outcomes

1

Description
Motor performance

Timepoint
At the beginning of the study (before the start of the intervention) and after 8 weeks of intervention

Method of measurement
Single leg jump test and side jump test

2

Description
Postural control

Timepoint
At the beginning of the study (before the start of the intervention) and after 8 weeks of intervention

Method of measurement
Y Balance test

3

Description
Strength

Timepoint
At the beginning of the study (before the start of the intervention) and after 8 weeks of intervention

Method of measurement

Dynamometer

Secondary outcomes

empty

Intervention groups

1

Description
Intervention group: Plyometric exercise, for 8 weeks, 3 sessions per week, 2 hour per session
Category
Treatment - Other

2

Description
Intervention group: Plyometric exercise with EMS, for 8 weeks, 3 sessions per week, 2 hour per session
Category
Treatment - Other

3

Description
Control group: Without any training and just doing normal daily activities
Category
N/A

Recruitment centers

1

Recruitment center
Name of recruitment center
Raja University
Full name of responsible person
Sahar Rezaei
Street address
Novrizian, Motahhari blvd.
City
Qazvin
Province
Qazvin
Postal code
95834-34148
Phone
+98 28 3367 7101
Email
Rezaei.sah@gmail.com

Sponsors / Funding sources

1

Sponsor
Name of organization / entity
Raja university
Full name of responsible person
Hadi Miri
Street address
Novrizian, Motahhari blvd.
City
Qazvin
Province
Qazvin
Postal code
95834-34148
Phone
+98 28 3367 7101
Email
hd.miri@gmail.com
Grant name
Grant code / Reference number
Is the source of funding the same sponsor organization/entity?
Yes
Title of funding source
Raja university
Proportion provided by this source
5
Public or private sector
Private
Domestic or foreign origin
Domestic
Category of foreign source of funding
empty
Country of origin
Type of organization providing the funding
Academic

Person responsible for general inquiries

Contact
Name of organization / entity
Hakim Sabzevari University
Full name of responsible person
Hossein Shahrokhi
Position
Assistant professor
Latest degree
Ph.D.
Other areas of specialty/work
Corrective Exercise
Street address
Hakim Sabzevari University - Tohidshahr - Sabzevar
City
Sabzevar
Province
Razavi Khorasan
Postal code
9617976487
Phone
+98514401101
Email
h.shahrokhi@hsu.ac.ir

Person responsible for scientific inquiries

Contact

Name of organization / entity
Hakim Sabzevari University
Full name of responsible person
Hossein Shahrokhi
Position
Assistant professor
Latest degree
Ph.D.
Other areas of specialty/work
Corrective Exercise
Street address
Hakim Sabzevari University - Tohidshahr - Sabzevar
City
Sabzevar
Province
Razavi Khorasan
Postal code
9617976487
Phone
+98514401101
Email
h.shahrokhi@hsu.ac.ir

Person responsible for updating data

Contact
Name of organization / entity
Hakim Sabzevari University
Full name of responsible person
Hossein Shahrokhi
Position
Assistant professor
Latest degree
Ph.D.
Other areas of specialty/work
Corrective Exercise
Street address
Hakim Sabzevari University - Tohidshahr - Sabzevar
City
Sabzevar
Province
Razavi Khorasan
Postal code
9617976487
Phone
+98514401101
Email
h.shahrokhi@hsu.ac.ir

Sharing plan

Deidentified Individual Participant Data Set (IPD)
Yes - There is a plan to make this available
Study Protocol
Yes - There is a plan to make this available
Statistical Analysis Plan
Yes - There is a plan to make this available
Informed Consent Form
Yes - There is a plan to make this available
Clinical Study Report
Yes - There is a plan to make this available
Analytic Code
Yes - There is a plan to make this available
Data Dictionary
Yes - There is a plan to make this available
Title and more details about the data/document
All potential data can be shared after people have not been identified
When the data will become available and for how long
Start the access period one year after printing the results
To whom data/document is available
Data will be available to academic and scientific researchers
Under which criteria data/document could be used
Any kind of functional analysis on the submitted data is allowed
From where data/document is obtainable
Email: h.shahrokhi@hsu.ac.ir
What processes are involved for a request to access data/document
by Email: h.shahrokhi@hsu.ac.ir and the reason for using the documents
Comments